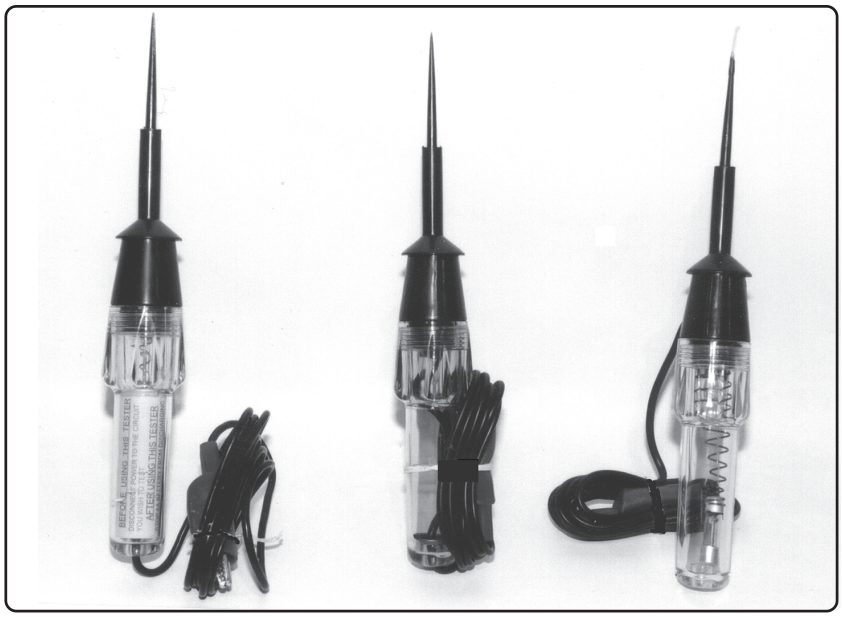
CEN-TECH™

CIRCUIT TESTER
3-PIECE SET

Model 94130

ASSEMBLY & OPERATING INSTRUCTIONS



Due to continuing improvement, actual product may differ slightly from product described herein.

Distributed Exclusively by
HARBOR FREIGHT TOOLS®

3491 Mission Oaks Blvd., Camarillo, CA 93011

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For technical questions and replacement parts please call 1-800-444-3353.

THANK YOU for choosing a **HARBOR FREIGHT TOOLS** product. For future reference, please complete the owner's record below:

Model_____ **Serial No.**_____ **Purchase Date**_____

SAVE THE RECEIPT, WARRANTY AND THESE INSTRUCTIONS. It is important that you read the entire manual to become familiar with the unit BEFORE you begin assembly.

Technical Specifications

Material:	Various thermoplastics, tapered steel probes, 18 gauge stranded copper wire, zinc-plated alligator clip
Dimensions:	Each Tester is 8" in lenght
Probe Type:	Needle Point with plastic cap, 1.75" L
Voltage Range:	6/12/18/24/36 D/C
Lead Wire:	48" Long, included with each tester
Battery:	Tester "A" requires one "AA", 1.5V battery (not included).
Bulb:	Bulb A: 1.2V, 2W; Bulb B: 36V, 3W; Bulb C: 12V, 3W

IMPORTANT SAFETY INSTRUCTIONS!

READ ALL INSTRUCTIONS BEFORE USING THIS PRODUCT!

Safety Warnings and Precautions

WARNING: When using product, basic safety precautions should always be followed to reduce the risk of personal injury and damage to equipment.

Read all instructions before using this product!

1. **Keep work area clean**. Cluttered areas invite injuries.
2. **Check for damaged parts**. Before using any product, any part that appears damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for any broken or damaged parts and any other conditions that may affect its operation. Replace or repair damaged or worn parts immediately.
3. **Replacement parts and accessories**. When servicing, use only identical replacement parts. Use of any other parts will void the warranty.
4. **Always check hardware and assembled parts after assembling.** All connections should be tight and hardware tightened.
5. **Keep children away.** Children must never be allowed in the work area. Do not let them handle the Circuit Testers.
6. **Dress properly**. Wear restrictive hair covering to contain long hair.
7. **Use eye protection**. Always wear ANSI approved impact safety goggles when using this product.
8. **Maintain product with care**. Store the Circuit Testers in a dry location.
9. **There are certain applications for which these Circuit Testers were designed. Do not modify these Circuit Testers and do not use them for a purpose for which they were not intended.**

10. **Do not use the Circuit Testers if under the influence of alcohol or drugs.** Read warning labels on prescriptions to determine if your judgement or reflexes are impaired while taking drugs. If there is any doubt, do not use the Circuit Testers.

11. **Maintain labels and nameplates on the Circuit Testers.** These carry important information. If the labels are unreadable or missing, contact Harbor Freight Tools for replacement.

12. **The Circuit Testers should be kept away from children.**

WARNING! Risk of explosive gases:

13. **Working in the vicinity of lead-acid batteries is dangerous. Batteries generate explosive gases during normal battery operation. For this reason, it is of utmost importance that each time before using these Circuit Testers you read and understand all safety warnings and precautions as outlined in this manual and those manuals published by the battery and vehicle manufacturers and manufacturers of any equipment you intend to use in the vicinity of the battery.**

14. **Make sure someone is within range of your voice and close enough to come to your aid when you work near a lead-acid battery.**

15. **Keep plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.** Avoid touching eyes while working near a lead-acid battery. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters the eyes, immediately flood eyes with running cold water for at least 10 minutes and get medical attention immediately.

16. **NEVER smoke or allow a spark or flame in the vicinity of a lead-acid battery or vehicle engine.**

17. **Use caution to reduce the risk of dropping a metal tool onto a lead-acid battery.** The tool may spark or short circuit the battery or other electrical part that may cause an explosion.

18. **Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery.** A lead-acid battery can produce a short circuit current high enough to weld a ring or other metal item, causing a severe burn.

WARNING! Operate a combustion engine only in well-ventilated areas. A running engine produces carbon monoxide. Carbon monoxide gas is colorless, odorless, toxic gas that can cause serious injury or death.

WARNING: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

Unpacking

When unpacking the 3 Piece Circuit Tester Kit, check to make sure parts on pages 5 and 6 are included. If any parts are missing or broken, please call **HARBOR FREIGHT TOOLS** at **1-800-444-3353.**

Operation

Your Circuit Tester comes completely assembled. It is important that you read the entire manual to become familiar with the product BEFORE you use the Circuit Testers.

The 3 Piece Circuit Tester Set contains each of the following Circuit Testers:

A: Self-Powered Electrical Continuity Tester. Use this tester to test for continuity with the power disconnected. For use on recreational and general automotive vehicles.

Operation: This Tester requires one "AA" battery. Disconnect the vehicle battery. Attach the Alligator Clip (12A) to a ground of the vehicle, such as the vehicle's body. Poke the tip of the Probe (1A) through the wire's jacket and touch the metal of the wire. If the circuit is complete, the Bulb (7A) will illuminate; this indicates there is electricity flowing through the circuit. No illumination of the bulb indicates no electricity flowing through the circuit and that repair or replacement of the components being tested is needed.

B: Heavy Duty Circuit Tester (Green) for 18, 24, and 36 Volt systems. Use this tester to check AC or DC wiring up to 36 Volts. Use to check series-parallel switches and solenoid on tractor-trailer starter systems.

Operation: Use this tester with the battery connected. The vehicle does not have to be running. Connect the Alligator Clip (11B) to the vehicle as a ground; or connect it to the negative battery post. Poke the tip of the Probe (1B) through the wire's housing and touch the metal of the wire. If the circuit is complete the Bulb (6B) inside the Handle (7B) will illuminate; this indicates there is electricity flowing through the circuit. No illumination of the Bulb (7B) indicates no electricity flowing through the cirecuit and that repair or replacement of the components being tested is needed.

C. High and Low Voltage Tester: Use this tester to check primary circuits of 6 and 12 Volts. Use to trouble shoot both primary and secondary circuits. On secondary or high voltage circuits you can check spark plugs or distributor caps. To test spark plugs and secondary (ignition) circuit, do not ground clip. Attach clip to nose of plastic probe housing. With engine idling, run probe of tester along wire from distributor to plugs. To test plugs, insert probe through plug cap. Extreme brightness of long bulb flashes is sign of high resistance or plug gap is set too far apart. Bright even flashes indicate normal ignition. Extreme dimness indicates low resistance and means carbon deposits have formed on plug electrodes or plug is not firing properly for other reasons. Remove plug for closer check after cleaning.

⚠ WARNING

To avoid serious injury form electrical shock, DO NOT TOUCH the probe with your bare hands while preforming high voltage test!

Changing the Bulb

1. For Tester A and Tester B:Unscrew the Probe Base from the Handle. Remove the Spring -see Figure 1. Unscrew the Bulb from the Bulb Socket. Screw a new Bulb into the Bulb Socket. Screw Probe Base and Handle back together-see Figure 1.

2. For Tester C: Unscrew the Probe Base (2C) from the Handle (black) (9C). Unscrew the Bulb (low voltage) (6C) from the Bulb Socket (3C) and Spring (5C). Remove the Fuse from the Spring (7C) and Handle (9C). Replace Bulb (6C) and Fuse (high voltage). Reconnect Probe Base (2), Handle (9) with Springs (5/7).

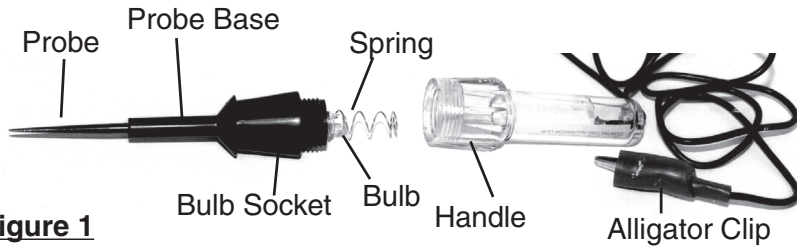
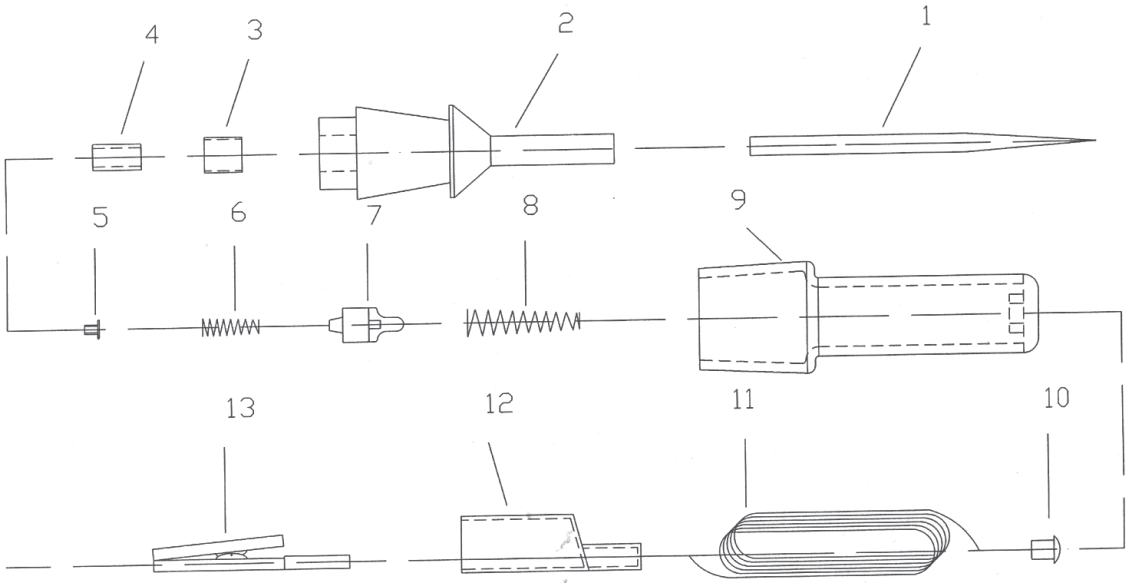


Figure 1

Parts List-Tester A

Part #	Description	Quantity	Part #	Description	Quantity
1A	Probe	1	8A	Spring	1
2A	Probe Base	1	9A	Handle (red)	1
3A	Bulb Socket	1	10A	Metal Contact	1
4A	Plastic Sleeve	1	11A	Electrical Wire	1
5A	Metal Contact	1	12A	Insulator for Alligator	
6A	Spring	1		Clip	1
7A	Bulb	1	13A	Alligator Clip	1

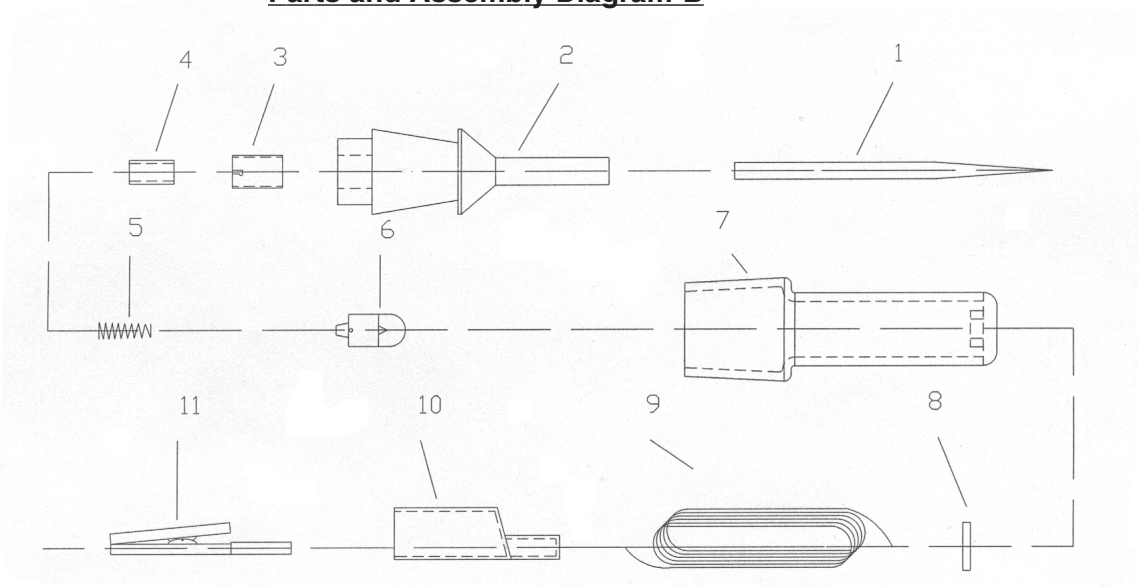
Parts and Assembly Diagram-A



Parts List-Tester B

Part #	Description	Quantity	Part #	Description	Quantity
1B	Probe	1	8B	Wire Retainer	1
2B	Probe Base	1	9B	Electrical Wire	1
3B	Bulb Socket	1	10B	Insulator for Alligator Clip	1
4B	Plastic Sleeve	1	11B	Alligator Clip	1
5B	Spring	1			
6B	Bulb	1			
7B	Handle (green)	1			

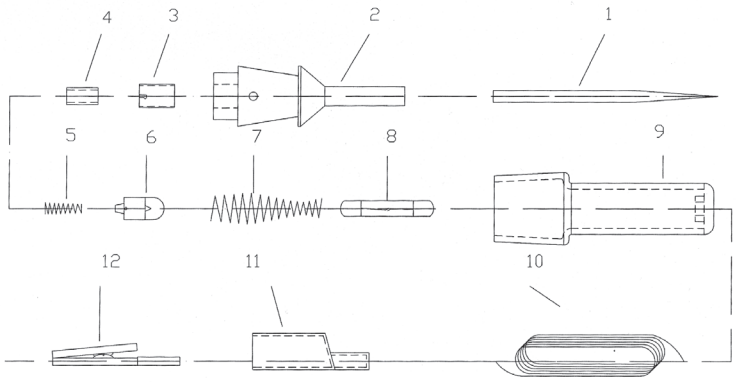
Parts and Assembly Diagram-B



Parts List-Tester C

Part #	Description	Quantity	Part #	Description	Quantity
1C	Probe	1	8C	Fuse (high voltage)	1
2C	Probe Base	1	9C	Handle (black)	1
3C	Bulb Socket	1	10C	Electrical Wire	1
4C	Plastic Sleeve	1	11C	Insulator for Alligator Clip	
5C	Spring	1			
6C	Bulb (low voltage)	1	12C	Alligator Clip	1
7C	Spring	1			

Parts and Assembly Diagram-B



Maintenance

1. To clean the Circuit Tester, remove the Alligator Clip (A-13, B-11, C-12) from any/all power sources. Wipe the outside with a clean, damp cloth, using a mild soap with water if necessary. Dry off wtih a soft, clean cloth. Do not immerse this product in any liquids.

2. Store in a secure, safe and dry location. Store in a location that can be locked and that is out of the reach of children.

Note: Some parts are listed and shown for illustration purposes only and are not available individually as replacement parts.

PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER NOR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

Warranty Card

CEN-TECH **LIMITED 1 YEAR WARRANTY**

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of one year from the date of purchase. This warranty does not apply to damage due directly or indirectly to misuse, abuse, negligence or accidents; repairs or alterations outside our facilities; or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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